STUDIES IN HIGH-SCHOOL PROCEDURE—DIRECT AND INDIRECT TEACHING

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In the third Nemean Ode of Pindar occurs an obscure passage which the English commentator Bury translates as follows:

> He whose knowledge is a lesson learned is a man in darkness, whose thought is as veering gale, and who never cometh to port with unerring course, but with ineffectual mind tasteth a thousand excellencies.

For so many generations have teachers relied upon the "lesson learned" as the normal and ordinary procedure that lesson-assigning and lesson-getting have come to be pretty nearly synonymous with teaching and education in general in the mind, not only of the teacher, but of the general public as well. To such an extent is this true that even such praiseworthy innovations as the supervised-study movement have often tended to break down because they have merely tended to substitute one form of lesson-getting for another. Too often at that the new form of lesson-getting costs in training more than it gains in efficient learning. The nib of the whole supervised-study proposal is in the possibility it affords of substituting direct for indirect learning. Failing to make such a substitution, it often turns out to be only a partial success.

The lesson-giving, getting, and hearing type of procedure is really based upon the assumption that learning a lesson is transferable to learning the thing the lesson stands for. If the pupil learns something about Latin and enough about it, the assumption is that he can eventually read the thought of the Latin page. If he learns about the law of falling bodies, he will understand their behavior. If he can master a dozen pages in economics and stand cross-examination thereon, he will understand and can successfully react to the principles therein set forth. Such is the assumption, and baldly stated few would subscribe to it in theory, whatever their practice.

Students of the teaching process have for many years felt the underlying pedagogic fallacy and embarked on various corrective expedients. Since the fallacy manifests itself most commonly in its product, which is inability to "apply knowledge," teachers have commonly tended to seek a corrective by changing the material of instruction, substituting applied science and mathematics for bodies of coherent principles, and in general developing an almost morbid liking for the commonplace and familiar as material. Indeed, in numerous instances attempts have been made to meet the difficulty by changing the whole theory of education, and schools have grown up which are in essence little more than children's clubs, ordinary informal education being substituted for systematic formal education. Such steps are in general praiseworthy and in the right direction, but they fail to reach the root of the matter—as I shall attempt to show. No change in material will of itself and alone mend the difficulty. The latter lies in the fallacy of the lesson-learning assumption, which the poet expresses in the lines quoted at the beginning of this article. No material can be mastered so as to be available in functional form on a lesson-learning type of procedure, the fact that the material is in itself functional to the contrary notwithstanding.

The best primary teaching of reading and the best modern language work in the secondary school have pointed the way out of the fundamental erroneous assumption. I should perhaps add to these instances good teaching procedure in many vocational schools and branches, and good teaching of music.

The teaching of reading started life as a lesson-learning proposition. That is to say, written discourse was analyzed, the elements learned, and children were expected to build up out of the elements ability to read the thought from the printed page. Ineffectiveness was felt, though its magnitude was not realized until the modern testing movement had revealed the extent to which even relatively mature pupils are unable to comprehend what they read. Reformers went zealously to work, and teaching technique was wonderfully improved, down to the latest phonic system; but always improvement was directed to improving the learning of the elements. Not until teachers of independent temper and in the

habit of thinking in terms of the learning process itself began to do direct teaching of thought-getting through the word-and-sentence method did economical and efficient teaching of reading come into existence. Pupils of the older methods could and do pronounce words with more or less remarkable facility, but their capacity to interpret the printed page was and is uncertain and uneconomical at best. If the pupils of the newer method learn anything at all, they learn thought-getting.

Similarly, modern language teaching was for generations based upon the learning of grammar and the assimilating of grammatical principles, upon the assumption that such learning would transfer to ability to read and speak the meaning of the foreign tongue. Such ability, when it appeared at all as an independent and useful capacity, as it seldom did, was acquired only with great labor and a ruinous expenditure of time. As in the case of reading, improvement devoted itself to technique, leaving the underlying conception of method in the old indirect form. Improvement in results was quantitative rather than qualitative, and the quantity did not amount to much. Only with the advent of consistent direct teaching, in the form of reaction to foreign language discourse, did the learning process become economically productive of early ability to read in the foreign tongue.

And so I might illustrate from the other two fields cited above, the vocational schools and the teaching of music. In every case learning is positive and effective in proportion as it is direct classroom work with no assignment of lessons, except assimilative material, and no intervention of inhibitory learning about the ability to be acquired. It is true that the ancient fallacy is still so deeply rooted in the mental processes of most progressive teachers that they cannot break entirely away and become entirely consistent, and their results suffer in proportion.

In the course of the last school year several sets of test material in Latin and French drawn from our laboratory were scrutinized in the endeavor to detect relations between attainment in sight reading, which is assumed to be the ultimate test of ability to react to the thought of the printed page, and attainment in a prepared lesson in translation.

TABLE I

Sight		Prepared	
Pupil	Score	Pupil	Score
Latin I			
A	100	C	100
B	100	L	95
C	100	D	95
D	95	E	95
E	95	K	95
F	95	A	95
G	90	G	95
H	90	F	95
I	90	J	90
J	85	H	90
K	81	B	85
L	76	M	81
M	76	N	81
N	71	I	81
O	67	O	76
Latin II			
A	96	C	100
B	87	E	100
C	87	B	100
D	61	A	96
E	52	N	96
F	44	D	96
G	44	K	96
H	44	F	87
I	39	P	78
J	39	J	74
K	39	I	70
L	35	L	70
M	35	R	65
N	30	H	65
O	30	G	61
P	26	T	57
Q	22	Q	52
R	17	S	48
S	13	O	44
T	9	M	35

TABLE I—*Continued*

Sight		Prepared	
Pupil	Score	Pupil	Score
Latin III			
A	59	H	91
B	59	D	91
C	54	C	82
D	50	N	82
E	45	O	82
F	40	A	76
G	41	P	76
H	36	F	72
I	36	J	72
J	32	L	68
K	32	B	63
L	32	M	50
M	27	G	50
N	27	E	50
O	27	I	36
P	14	K	32
Latin IV			
A	92	H	100
B	81	I	100
C	73	A	100
D	73	E	100
E	69	B	96
F	65	D	96
G	62	P	92
H	58	F	92
I	58	O	92
J	54	G	83
K	46	C	85
L	46	J	81
M	46	L	81
N	35	M	81
O	27	N	69
P	19	K	65

For this purpose, a passage was set for sight reading and the papers gathered. The same passage was then assigned for prepared work, and the translation written the following day. Both sets of papers were then scored for comprehension by dividing the passage into thought units and noting to how many of these

thought units each pupil had correctly reacted. No account was made of exact grammatical rendering, provided the pupil had evidently reacted correctly to the thought intended to be conveyed. The method is, of course, available only for a comparative study in which the personal equation of the scorer is the same on both the sight and the prepared passage. For purposes of determining the actual attainment of the class and the individual pupils, the method is useful only for rough approximation. Table I exhibits the results in Latin. A section from each of the four classes was chosen at random. Pupils are arranged in order of attainment.

DISCUSSION OF LATIN EXHIBIT

In every case the material selected for study and testing was a passage chosen from the Latin being read, but, of course, in every instance an unfamiliar passage: in Latin I, sentences similar to the material of the beginner's book; in Latin II, *B.G.* iv. 6; in Latin III, *In Cat.* iii. 17; in Latin IV, *Aeneid* v. 719–31. The test was run in January. School opens about October 1.

The transfer from lesson-learning to capacity to read Latin is much higher in Latin I than elsewhere. In three cases here the pupil reads at sight better than he prepares the same material. This may be due to any of several causes, but one of the causes may be that the pupils have not yet acquired the lesson-learning habit in this subject, and the process of preparation contains inhibitory elements operating on their power to react, which has predominantly been directly acquired. In four cases, power as measured by the test is exactly the same as the achievement in the same work subsequently prepared. There are four other similar cases in the other sections, and several in which pupils read at sight substantially as well as they prepare the same work. There is an ambiguity here as to causes at work. It may mean that these eight pupils and the three first mentioned, eleven out of a total of sixty-seven, are direct learners in spite of the modified lesson-learning method which prevails; or it may mean that eight are cases in which lesson-learning clearly transfers to translation power. Specific psychological study of the cases would be required to settle the point in question.

The clearest type of revelation in this Latin series, however, is to be found by comparing the order of standing of pupils in the sight test with the corresponding order after the lesson has been prepared.

Now, if the pupil's acquired power to react to the meaning of the Latin has been gained through his daily preparation of translation, there should be a close correspondence between the order in which pupils stand after the lesson has been prepared and the order in which they stand on the sight test. That is to say, the best pupil on the prepared lesson should be the best pupil on the sight test and so on in pretty close order through the series. We should hardly expect the sight test to range so high as the test after preparation in any case, and in fact it does not. As a matter of fact, the departure from this expectation is in all four cases rather striking.

The Latin I group divides evenly into quintiles of three each. Comparing the two first quintiles, we find one pupil common; comparing the second, one; the third, one; the fourth, none, and the fifth, two. Pupil L, who is twelfth on sight reading, is second on the prepared list. Number 11 on sight is No. 5 on prepared. Pupils A and B reverse this tendency and appear lower on prepared than on sight. Not only is there little correspondence in order, but something over 25 per cent of the instances are markedly displaced in the comparison of columns.

Latin II is similarly divisible into quintiles. In the first quintiles, A, B, and C are common; in the second, there is one common case; in the third, three; in the fourth, none; in the fifth, two. Not a high correlation here, but somewhat better than in Latin I. Two pupils, N and R, are notably displaced; and five, D, H, G, M, and O, are relatively better on sight work than on prepared. It is noteworthy that this section had done distinctly more consistent direct learning than any other.

Latin III is divisible into quartiles. In the first quartiles, two are common; in the second, one; in the third, two; in the fourth, none. H and N are notably displaced upward in the prepared lesson; and A, B, G, and E, downward.

TABLE II

Pupil	Sight	Pupil	Prepared
		French I	
1	100	1	100
2	100	3	100
3	100	4	100
4	100	5	100
		6	100
5	96	7	100
6	96	8	100
7	96	9	100
8	96	10	100
9	96	12	100
10	96	15	100
11	96	17	100
12	96	20	100
		21	100
13	93	22	100
14	93	25	100
15	93	26	100
16	93	28	100
17	93	29	100
18	93	32	100
		33	100
19	89	34	100
20	89	35	100
21	86	2	96
22	86	11	96
		13	96
23	82	14	96
24	82	16	96
		18	96
25	79	24	96
		31	96
26	75	38	96
		39	96
27	71		
28	71	23	93
29	71	27	93
30	68	30	89
31	68		
		19	86
32	61	36	86
		37	86
33	54		
34	50		
35	50		
36	50		
37	46		
38	46		
39	36		

TABLE II—*Continued*

Pupil	Sight	Pupil	Semester Grades
French II			
1	100	1	100
2	97	8	97
3	97	20	97
4	90	5	90
5	90	3	90
6	90	16	90
7	90	18	90
8	83	12	83
9	79	2	79
10	76	11	76
11	76	17	76
12	72	9	72
13	69	6	69
14	69	13	69
15	69	15	69
16	66	10	69
17	66	19	66
18	66	4	66
19	62	7	66
20	48	14	62

Latin IV is also divisible into quartiles. In the first quartiles, there is one case common; in the second, one; in the third, one; in the fourth, two. Pupils H, I, P are displaced upward; and G and C downward.

To sum up the evidence from the Latin, the array is nowhere what would be the case if prepared lesson-learning were directly transferable to the corresponding capacity; and in 25 per cent of the cases the lack of correspondence in individual pupils is striking. Let us turn to the French exhibit and ascertain whether or not a similar state of affairs is revealed there.

Unfortunately, the purpose for which the French material was originally secured did not involve the same kind of comparative study between sight and the same passage prepared as was possible in the case of Latin. However, we have the same kind of study available for French I and a comparison between sight capacity and semester grades in a French II division. In the case of the

latter we have much the same sort of data as in the case of Latin, but data which exhibit the same situation from another viewpoint.

DISCUSSION OF FRENCH EXHIBIT

French I was a division which was taught by approximately direct methods. The method used was direct in the current modern-language sense of the term, that is to say, the approach was directly to the reading of the language without preliminary introduction by way of a study of grammatical principles. Such principles were learned through their functional use in reading and in reacting to spoken French. There was constant use of the assigned lesson, however, in the form of exercises. There was not in use a technique which constantly proposed to itself the question, Is this pupil learning to react to written and spoken French discourse? And, if not, why not? The course was set, exercises were given, class technique was very efficient up to the point suggested by the question. Beyond that, here as elsewhere, pupils learned or they did not—learned well or ill, depending upon their language ability, interest, devotion to study, ambition, and the various other conditions of individual relation to school and class work. As will be seen, half the class did very well indeed, bearing in mind that this was a January sight-reading test for pupils beginning in October.

Under these conditions, there is a much clearer correlation than in the case of Latin. In most of the cases, pupils do very well indeed at sight and, upon being given a chance to read over and prepare the material, correct their faults and turn in perfect or nearly perfect papers. There are, however, several conspicuous cases in which learning is evidently of the lesson-learning type. Pupils 21, 22, 25, 26, 28, 29, 32, 33, 34, 35 show results varying all the way from fair capacity to very inferior capacity on the test, but all were able to produce perfect papers as soon as they had an opportunity to get into the lesson-learning attitude. The same thing is true to a lesser degree of several others. Pupils 33, 34, 35, 38, and 39 are the most notable instances. There are a few instances in which pupils are displaced downward as in the case of Latin, but in no case beyond a slight degree, readily account-

able as instances of insignificant errors. So far, we have the normal outcome of direct learning, and the unfavorable results are assignable to the principle that the assigned lesson still held considerable sway in the method used, and to the further principle that individuals were not tested from time to time and retaught to the point of mastery.

Turning to French II, we have quite a different situation. Here, the semester grades are compared with the results of the sight test. Now, the semester grades are very largely a representation of the performance of individuals on a large number of assignments, of the fidelity with which pupils have discharged a duty assigned by the teacher. If, now, learning a lesson is readily transferable to learning to read French, the order of pupils in the semester-grade column should be very closely what it is in the sight-reading column. Such is not the case. Dividing the group into quintiles, we find in the first quintiles, sight and semester grade, one pupil common; in the second, none; in the third, two; in the fourth, two; in the fifth, one. Pupil 20 achieves a mark of 97 on semester grade and rates as a high honor pupil: but he is at the foot of the group on an easy test of capacity. Pupil 4, at the end of the semester, comes under admonition, and yet on a test of capacity there are but three better pupils in the group. Of the twenty pupils considered, six only do consistently well on both semester grades and capacity test.

We have no similar comparisons for the sciences and mathematics. Such comparisons are not so easily made, but they can be made without serious difficulty. It is a matter of comparing results in lesson-learning with the results of tests of capacity where the presumptions of lesson-learning have been removed. Some of my readers may be interested to carry out such a study.

So far as this study throws light, it seems to be fairly clear that in the case of this typical round of teaching in two high-school subjects under the best of conditions the transfer from lesson-learning to capacity is very uncertain and that it occurs in the cases of a small percentage of pupils. What we really succeed in doing is the training of capacity to get lessons, and some pupils become very adept in the process of lesson-learning. The result

leads us far from the use of the school as an institution for the development of genuine intellectual capacity. I am far from asserting that a similar scrutiny of all our secondary and collegiate schools and subjects would lead to the same conclusions, and I am equally far from asserting that it would not. If it is only in part true, the loss to society in what our teaching might have accomplished and has not and does not is not pleasant to contemplate.

This article is evidently a piece of destructive criticism. In another article, to appear later in the *School Review*, I hope to make some useful suggestions bearing on the way out.